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MODEL RESULTS AND OBSERVATIONS OF THE JOVIAN SYNCHROTRON RADIATION (Oral)

MODEL RESULTS AND OBSERVATIONS OF THE JOVIAN SYNCHROTRON RADIATION

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Jupiter's synchrotron emission has been observed extensively from earth-based radio observatories for more than 30 years. These observations provide important constraints on the magnetic field geometry and relativistic electron distribution in Jupiter's radiation belts. From a combination of observations and computer modeling we have been able to determine some parameters of the high energy electron population deep within Jupiter's radiation belts. Using a longitudinally symmetric electron distribution we are able to accurately model the observed rotational variability of the synchrotron emission. The model results suggest the radial profile of relativistic electrons can be described by a simple two component pitch angle distribution modified by losses associated with satellites and ring absorption. We will present results related to the radial dependence of the pitch angle, spatial density, and energy distribution of the electrons. The results have important implications to understanding the physical processes active in Jupiter's radiation belts and the required level of radiation hardening necessary for future missions to the Jupiter system and Europa.

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